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POSSIBILITIES: BY A NEW
METHOD.

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Reprinted from Mathews' Medical Quarterly, July, 1896.

LOUISVILLE:
JOHN P. MORTON & COMPANY.
1896

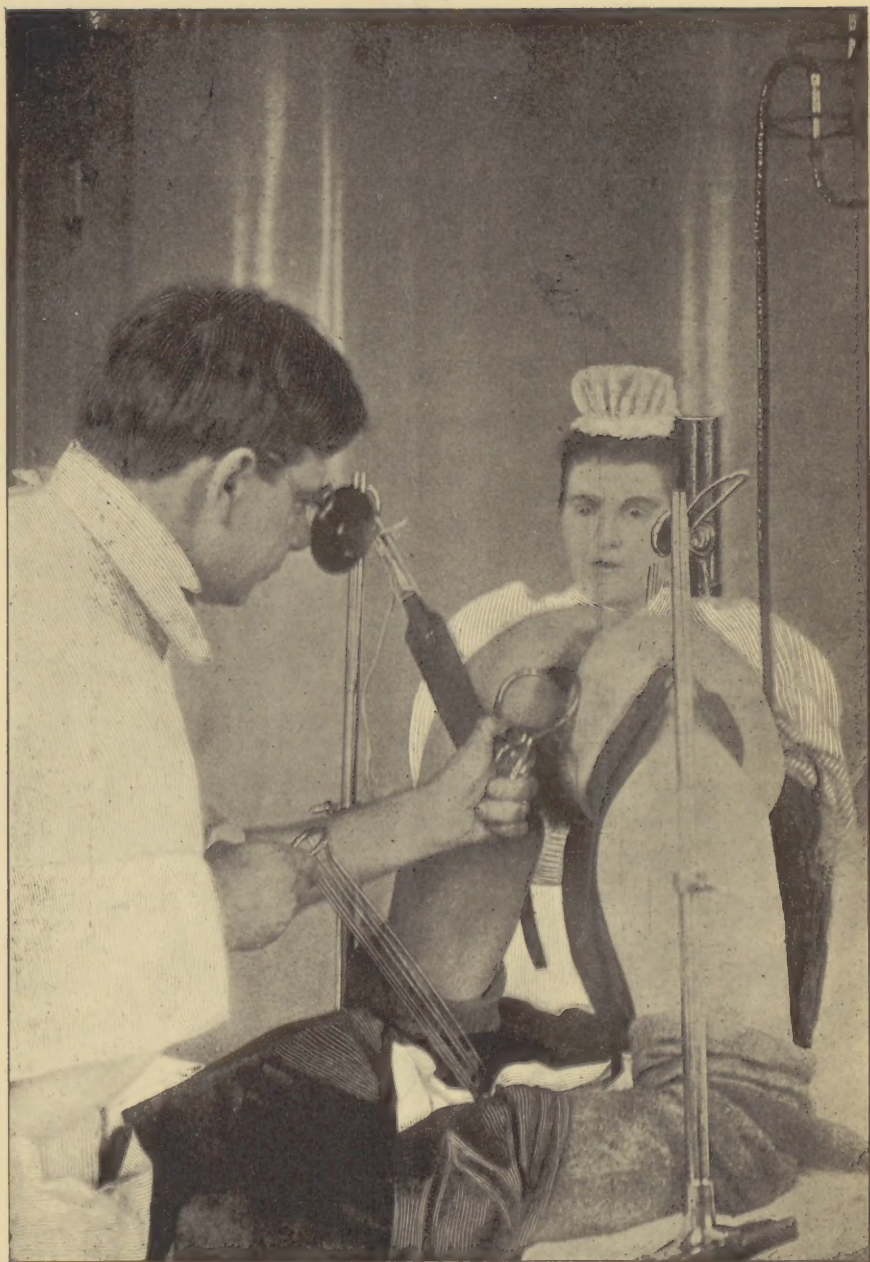


PLATE IV.—The First Step in Colonoscopy.

PROCTO-COLONOSCOPY AND ITS POSSIBILITIES: BY A NEW METHOD.*

(Illustrated.)

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It is almost universally true that surgeons who devote their energies to any field of anatomy embracing a tubular or hollow organ have devised some sort of mechanical contrivance, hoping to facilitate the obtaining of a better view of the part. The multiplicity of these attempts, the complexity of the devices projected, and the paucity of advantage resulting have been such that the great body of general medical practitioners have come to regard the speculum-making tendency of the specialist as an indication of *fin de siecle* degeneration, though not a particularly harmful form perhaps.

However, the very fact of the great number of rectal specula is sufficient evidence that all that could be desired in the way of inspection of this organ has not yet been achieved, and each additional device proposed is indicative of a restlessness and very wholesome desire for further progress.

*For the excellent drawings which illustrate this article I am indebted to Dr. Hubert Spence. He has very satisfactorily shown the extent to which the parts are exposed by this method of examination, and has accurately represented the relation of each viscus to all the other organs of its community.

To my assistant, Dr. Sneider, I am under obligation for the perfect negatives from which Messrs. Endean and Enwright have made the photographs which indicate the several steps of the procedure.

I am also very greatly indebted to Dr. C. M. Thurston for assistance in the preparation of the specimens shown by photograph.

The cylindrical tube and the beveled blade retractor are the essential elements of all these more or less elaborate rectal specula. Sims' simple vaginal speculum has been modified by Hegar, Van Buren, Helmuth, and Kelsey without practically increasing its usefulness. Single and double pairs of blades have been hinged together, with blades parallel or at radiating angles, with very creditable ingenuity and in almost as endless variety as in vaginal specula. Blades and cylinders have been fenestrated until there remained but little of them when in use but their pain provoking margins and their windows filled with pouting membrane. The results of all this expenditure of inventive and constructive power have until recently been most meager, the fenestrated tube giving but an imperfect view of one small longitudinal portion of the mucous membrane, while the bi-valve or tri-valve speculum permits at most an exposure of but two or three narrow areas, and that, too, to a depth not exceeding 7.62 cm. (three inches), the lateral exposure seldom exceeding more than half the anal circle.

Many years ago Bodenhamer endeavored to obtain a view of the sigmoid flexure† of the colon by joining two cylindrical tubes at an obtuse angle, and placing in their angle a mirror for the reflection of the image of that portion of the mucous membrane which prolapsed on the tube's distal end. The diagnostic value of this method, as well as of any specular examination of the rectum in the semi-prone or dorsal posture which exposes to view only that part which prolapses into the speculum, is really but little greater than are the subjective symptoms of the patient.

Very recently Dr. Howard Kelly made known‡ a method of inspection of the rectum which, when compared to the methods commonly practiced, is of very much greater practical value. His speculum consists of a cylindrical tube provided with an obturator and is similar to his cystoscope save that it is larger, and it does not essentially differ from the rectal specula of Andrews. With his characteristic genius Dr. Kelly inverts his patient to the knee-chest posture and applies to the rectum manipulations similar to those which distinguish his cystoscopy, thus employing a posture and a law of atmospheric distension which

† Ball, Surgery of the Rectum.

‡ Annals of Surgery, April, 1895.

were first employed by Otis years ago: a posture and principle which, by the way, rectal surgeons have been rather slow in borrowing from the gynecologist. A little practice in Kelly's method teaches the operator how to carry the end of the proctoscope away from the prostate, the uterus, or an obstructing valve, in order to obtain the atmospheric distension necessary to command a view of the rectal ampulla. In a few cases and under some conditions even this manipulation fails to secure the desired result. This method exposes to view a very much larger area of the rectum than is shown by the methods commonly practiced, but the diameter of the cylinder used is so small that the surgeon is perplexed because there is so limited a portion of the part accessible for surgical manipulation.

In the sigmoid flexure the surface exposed to view by Kelly's method is usually limited to that portion of the gut which falls across the end of the colonoscope. The method is simple, and when applied to the rectum alone is free from the danger of accidental injury to the patient.

The credit of priority in the use of the hollow cylinder and of the prone posture with elevated hips for rectal inspection properly belongs to that distinguished master of rectal surgery, the elder William Allingham. However, the technique by which he secured the posture and by which he introduced the tube § were so elaborate and inconvenient that his method has been but little employed.

There are certain instruments which are necessary to a complete visual inspection of the lower gut.

I shall now proceed to describe the method which I have formulated for ocular examination of the rectum and sigmoid flexure. The instruments employed are named in the time order of their use:

To support the patient in the genu-acromial posture a pair of firm uprights is necessary—those which I have devised may be clamped to the edge of the usual operating-table, or if that table be not at hand may be screwed into the surface of an ordinary kitchen or dining-table. The uprights telescope for portability.

My rectal speculum is aseptic, may be manipulated with ease, and is designed so as to obstruct the field of vision as little as possible. (Fig. 1.)

§ Allingham's Lectures on the Rectum and Anus.

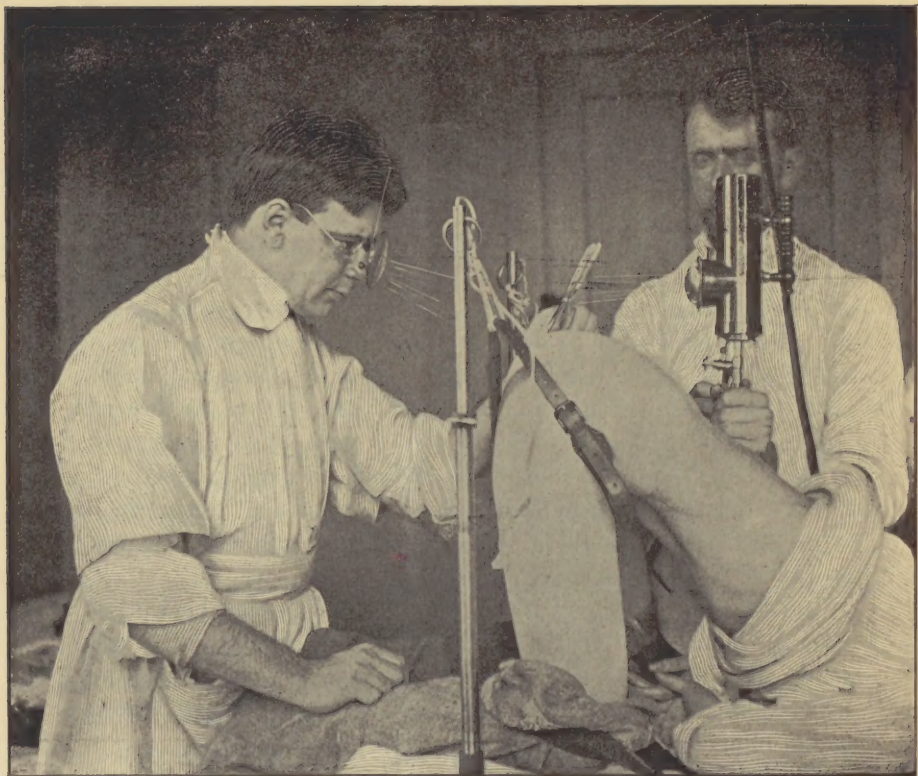


PLATE I.—The first step in Proctoscopy, showing the correct position of the patient, assistant, and operator. The speculum introduced and the parts divulsed. The operator commanding under reflected light a view of the rectum as high as the promontory of the sacrum.

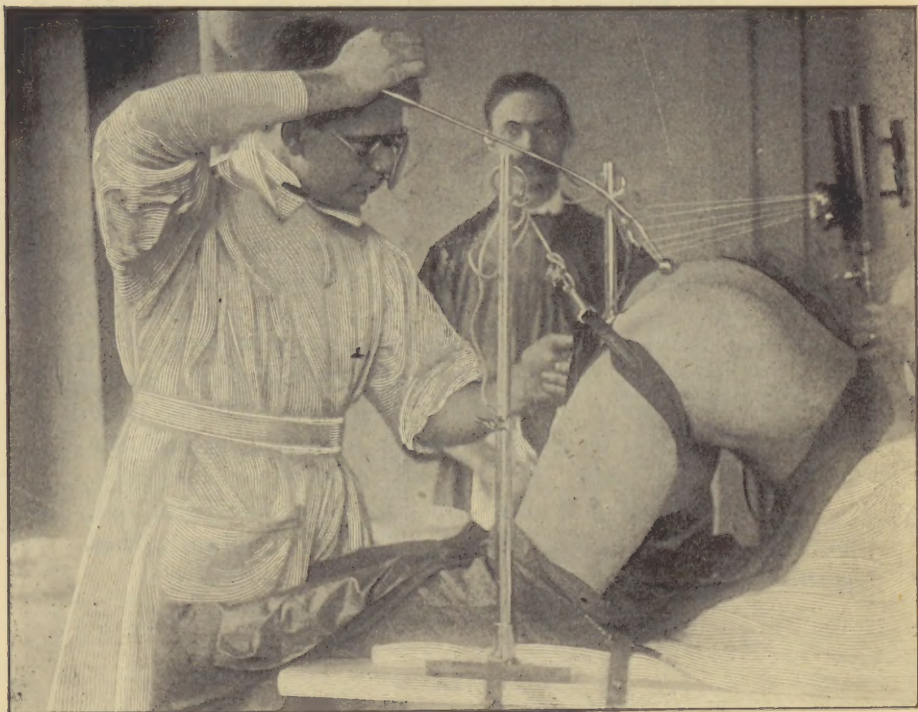


PLATE II.—Illustrates an incorrect position of the first assistant, lamp, and patient, and the correct position of the operator.



PLATE III.—Correct position of patient, assistant, and operator, showing sound in third position.



PLATE V.—Showing the Colonoscope introduced and the operator manipulating the colonoscopic mirror.



PLATE VI.—A photograph of a posterior view of the rectum and lower half of the sigmoid flexure. The specimen was taken from an emaciated male cadaver still in a state of *rigor mortis*. Preliminary laparotomy was performed and the bowels found in normal position, the sigmoid occupying the left iliac fossa. After emptying the bladder a small opening was made in the upper sigmoid, a hose pipe introduced, the anus opened, and the gut thoroughly flushed: the residue of water was then emptied, the part replaced to its normal situation, and the abdomen closed. The subject was then fixed in the knee-chest posture and a finger passed through the abdominal wound; the anus dilated and the length of the gut affected by the atmospheric inflation digitally ascertained. At this limit it was ligated. By degrees the gut was filled with melted paraffin, which was poured in at the anus. So soon as the substance had hardened the coccyx was removed, symphysiotomy performed, the mesenteric and other attachments divided, and the firm inflexible cast lifted out. Before removal its angles with reference to the perpendicular had been carefully observed; the photographs show the position of the rectum and lower sigmoid under atmospheric distension in a subject fixed in the genu-acromial posture. It will be noticed that as the sigmoid filled it rode out of the left iliac fossa across the middle line to the right—a fact not infrequently observed in proctoscopy.



PLATE VII.—A photograph of the same specimen pictured in Plate VI. Side view genu acromial posture.

The hook-mirror faces away from the operator and is provided with a shaft 20.32 cm. (eight inches) in length. This mirror may be used as a hook with which to pull aside obstructing valves. (Fig. II.)

The proctoscopic mirror faces the operator and is 3.81 cm. (an inch and a half) longer than its fellow. (Fig. III.)

In determining the direction of the upper end of the rectum and the position of the colon I employ as a sound a strong metal rod 45.73 cm. (eighteen inches) in length, having a limited range of flexibility and provided with a series of interchangeable bulbs. This instrument may be converted into a convenient applicator by substituting a piece of absorbent cotton for the bulb. (Fig. IV.)

Artificial illumination is required for inspection of the sigmoid flexure. This I have easily accomplished by equipping the ordinary light condenser with an iron bracket and drop-light gas-tube connection; an assistant directs this light into the head-mirror worn by the operator, from which it is reflected into the colon.

The two instruments essential to sigmoidoscopy are a long-handled mirror (Fig. V) and the colonoscope (Fig. VII). My colonoscope is 38.10 cm. (fifteen inches) in length and about 2.54 cm. (an inch) in diameter when in the bowel. It consists of a proximal handle ring and a distal steel bulb, connected by six strong steel spokes screwed safely into the bulb and secured firmly in the handle; two of these spokes may be removed to facilitate approach to a diseased area. For convenience in packing, the handle of the instrument has been made detachable. (Fig. VI.)

These instruments constitute a working set. After a little practice the searching sound may be dispensed with and the colonoscope immediately made to find *its own way* into the colon.

Three other instruments, however, I have found of use in the treatment of disease located high up in the rectum, the cup-curette, a very long insufflator, and the elevator. (Fig. VIII.)

The preparation of the patient for colonoscopy consists in a thorough evacuation of the bowels by means of a three-liter (about three quarts) flush of the colon eighteen hours prior to the time of inspection, the administration of a cathartic twelve hours before, and of a rectal enema of not more than 124 grams (four ounces) of a ten-per-cent. watery solution of glycerine one hour before the seance.



FIG. I.—The Rectal Speculum.
(Full size.)

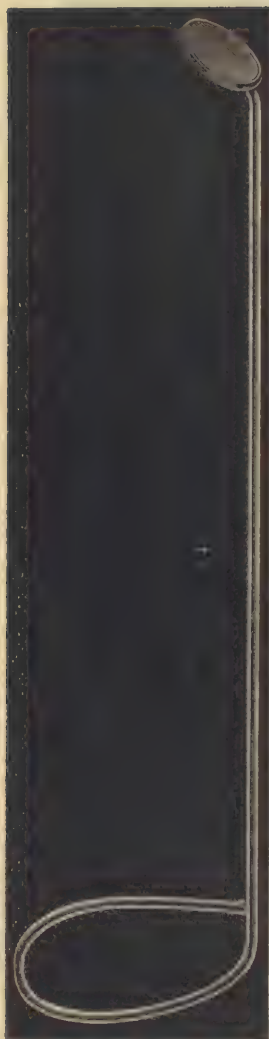


FIG. II.—The Hook-mirror.
(Half size.)

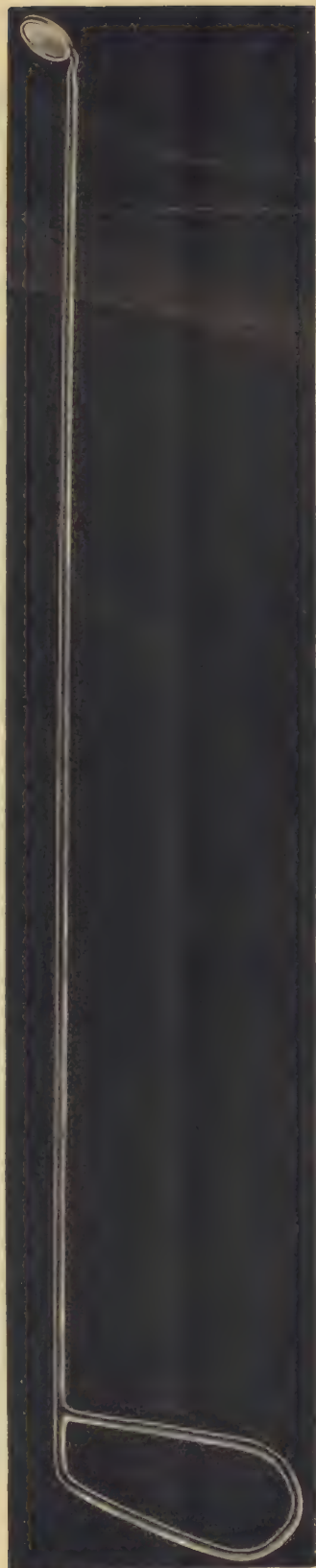


FIG. V.—The Colonoscopic Mirror
(Half size.)

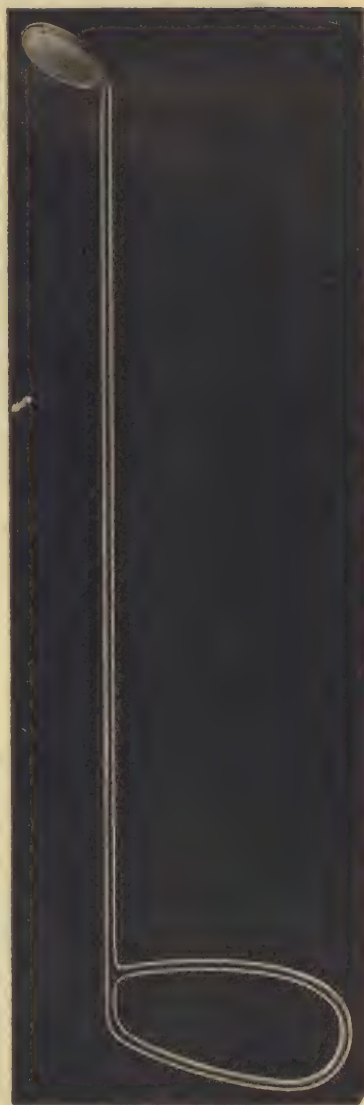


FIG. III.—Proctoscopic Mirror
(Half size.)

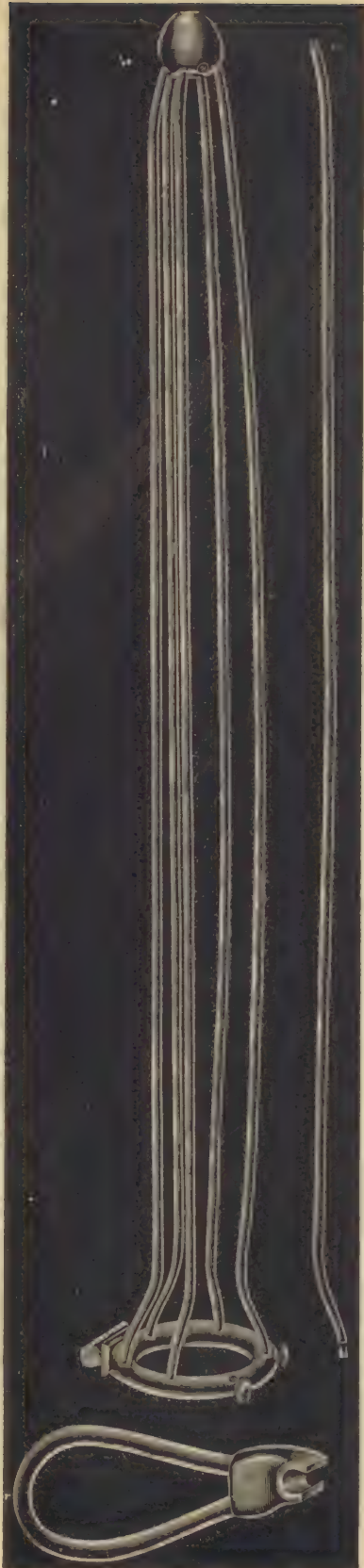


FIG. VI.—The Colonoscope with a spoke removed and the handle detached. (Half size.)



FIG. IV.—A strong flexible applicator and sound provided with interchangeable tips and a flexible handle. (Half size.)



FIG. VII.—The Colonoscope. (Half size.)

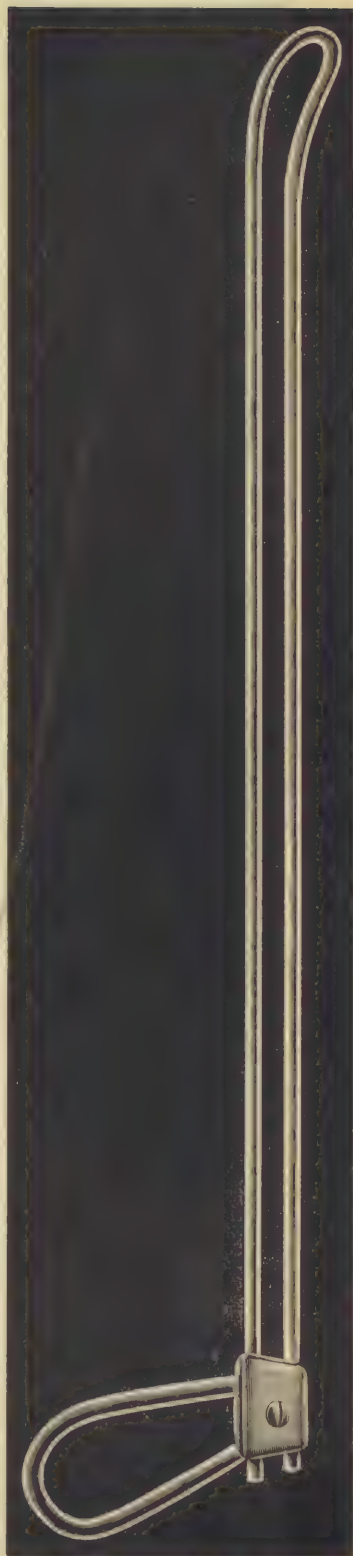


FIG. VIII.—The Elevator. (Half size.)

The posture of the patient is secured by the following steps: The patient is first anesthetized in the dorsal decubitus and drawn down until the nates present at the end edge of the table, then the thighs are flexed to a right angle and the patient turned to Sims' posture; the buttocks are now carried to the side edge of the table, and finally the trunk is elevated by raising the hips till the patient forms a tripod resting on knees and shoulder. The subject may be quickly secured in this position. (Plates I and IV.)

My assistant has given the anesthetic to patients in this position about a hundred times, and it has proven not only a possible posture,^{||} but many times the best one for the patient. Inversion for anesthesia is universally conceded to be most desirable in case of infants and very young children, but I should be as hesitant of placing the very old or subjects of diseased vessel walls in this position as I am, under the same conditions, of placing them in Trendelenburg's posture.

The manipulation of the instruments necessary to inspection: It is important that the instruments be kept immersed in water of 38° C. (100° F.), so that, when introduced, fog will not gather to obstruct the view. On account of the very different anatomical formation of the two parts, preliminary sphincter dilatation[‡] is not so necessary to proctoscopy as is dilatation of the female urethra to Kelly's cystoscopy, for in the performance of its function the anus often expands to as great a degree as is required for proctoscopy. Immediately, therefore, the nates may be separated by the finger and thumb of the left hand and the oiled speculum blades inserted to their arms; a quick divulsion of the anus will be followed by an immediate expansion of the rectum and a part of the sigmoid under the pressure of the intruding air. The lower of Houston's semi-lunar valves may now be pushed aside, the hook-mirror hooked over that valve at the junction of the middle and upper portions of the rectum, and the proctoscopic mirror placed opposite and in advance; now, if the two mirrors be intelligently manipulated, the gut may be visually examined to a depth of 25.4 cm. (ten inches). The transverse diameter of the rectum is variable; while in some places not more than 2.54 cm. (an inch), in others it is sometimes more than four times that

^{||} *Vide Andrews' Diseases of the Rectum*, page 22.

[‡] Kelly, *Annals of Surgery*, April, 1895.

diameter, so that the rectum may present to the eye of the imaginative student the appearance of a chain of urinary bladders communicating one with the other by means of irregularly elliptical openings set at varying axes, and bounded by the non-parallel borders of Houston's valves. In the normal rectum the air pressure smooths the mucous membrane evenly over the entire surface of the gut. The normal mucous membrane of the ampulla appears at first shiny, wet, and bluish gray. As it dries, under the influence of gravitation the blue, venous tint fades out of the gray and the wall becomes pink tinged; presently it assumes the appearance of parchment, painted at rare intervals with ramifying little arteries crowded and overlapped by the larger companion veins which are more ramifying and which more suddenly dive into the bowel wall. In time over all there comes a sheen as of collodion varnish, and the vascular pictures fade, save that one beneath the promontory of the sacrum. The high yellow light on the free border of the semi-lunar valves takes no part in this panorama of color. These phenomena appear exactly as described only in the healthy rectum; in disease the color varies much.

The flexible bulb-tipped sound may now be bent 5.08 cm. (two inches) out of line, oiled and carried into the open sigmoid, the handle then rotated 180° while at the same time the instrument is carried forward; the valve-like obstruction which is now met may be overcome by quickly directing the sound's bulb-end first at one angle and then at another until it is passed, and by elevating the handle the searcher glides on *almost of its own accord* to the diaphragm. The instrument may now be withdrawn, straightened one half and the performance repeated; thus it may be determined if the gut may be straightened out in the middle line parallel with the vertebral column to receive the colonoscope. This instrument at a temperature of 38° C. (100° F.) should be oiled, and with a regard for the sigmoid deviations determined by the sound, it may be introduced, and gently, almost *of its own weight* it will sink to the depth already reached by the sound. The long mirror if well warmed, spread with warm glycerine and placed within the colonoscope, will reveal to the eye of the operator those concave areas whose convexities are presented toward him. And thus, with no more applied mechanical

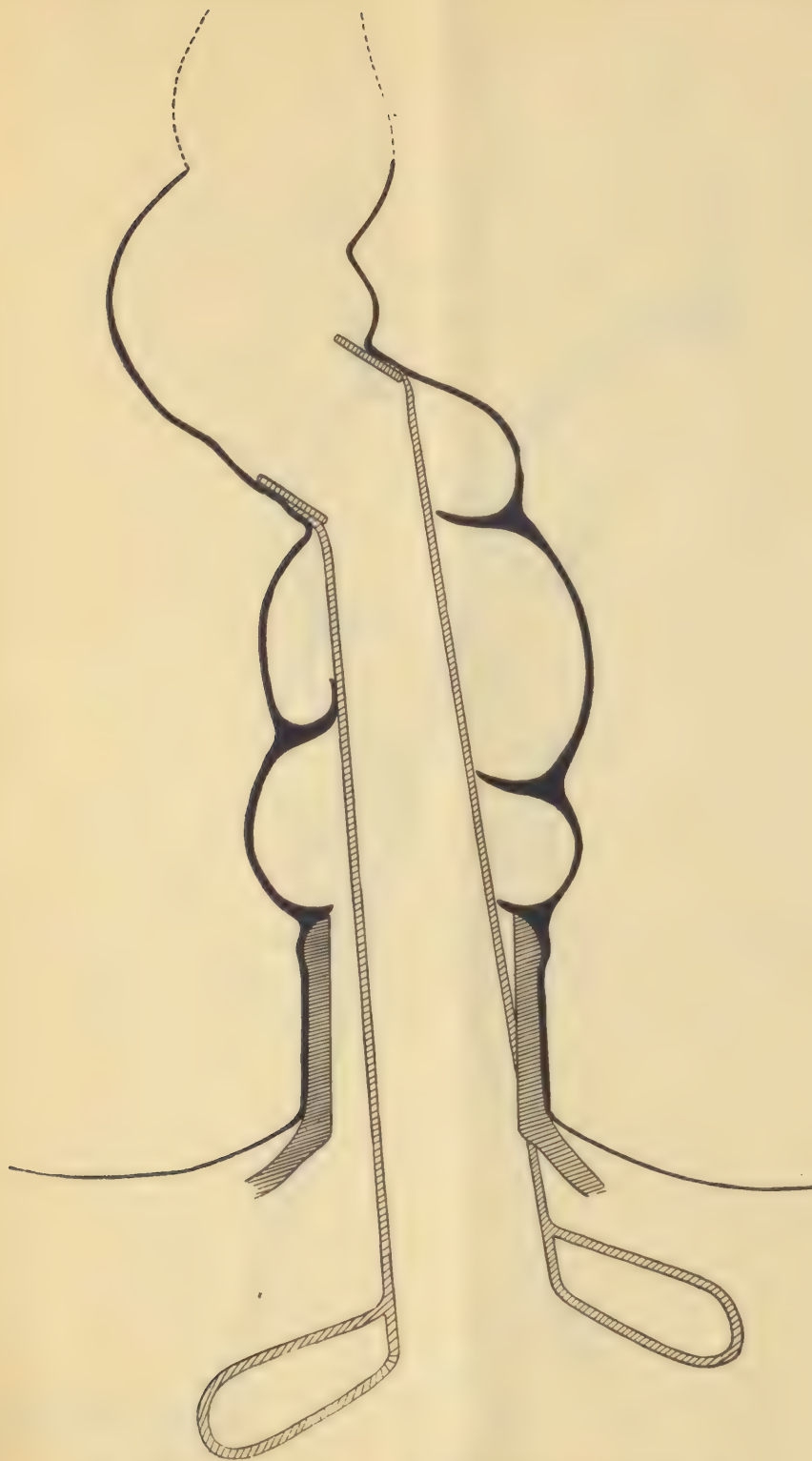


FIG. IX.—Diagrammatic Drawing of a Transverse Vertical Section showing the method of using the Mirrors. (Half size.)

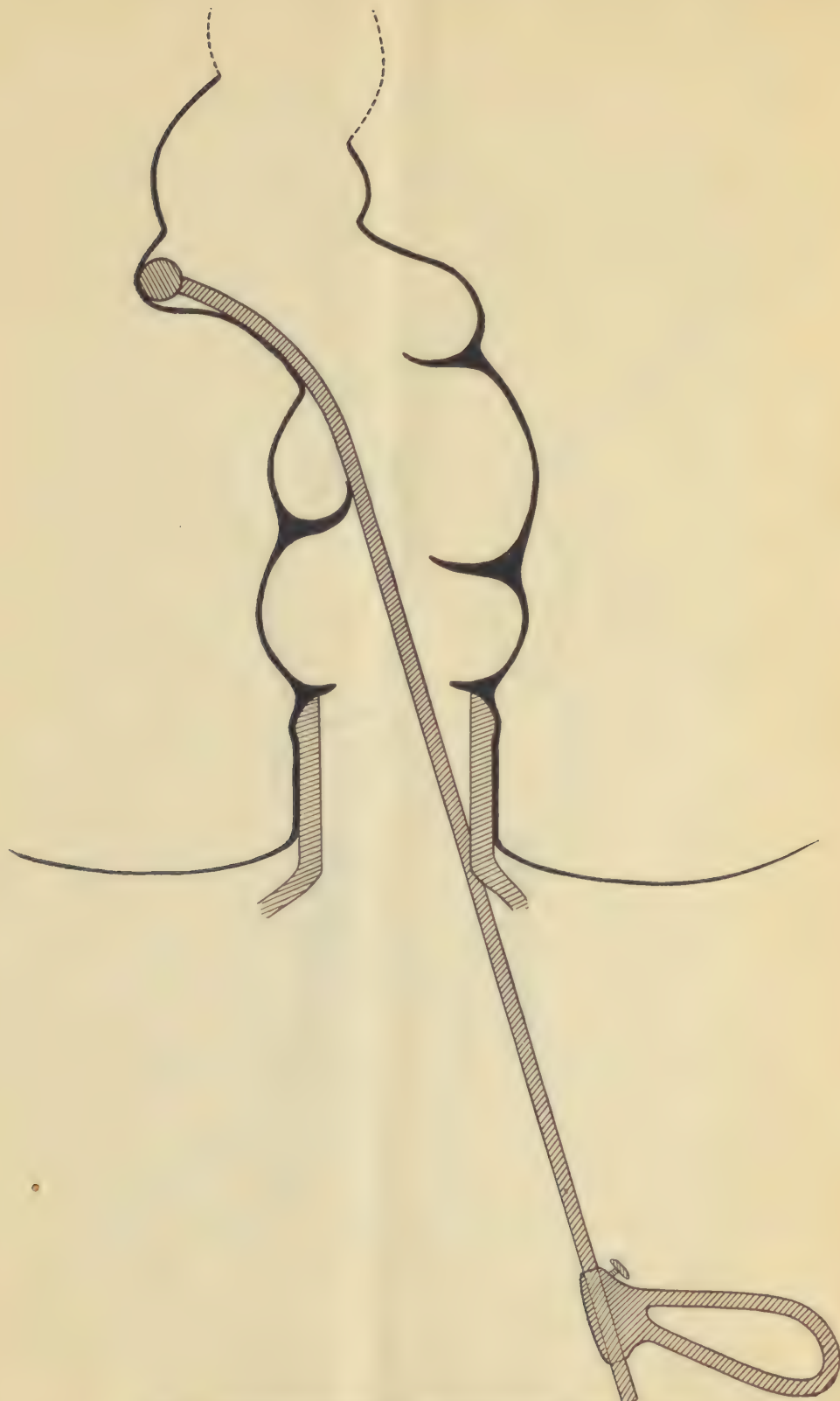


FIG. X.—Diagrammatic Drawing of a Transverse Vertical Section showing the sound in the first position. (Half size.)

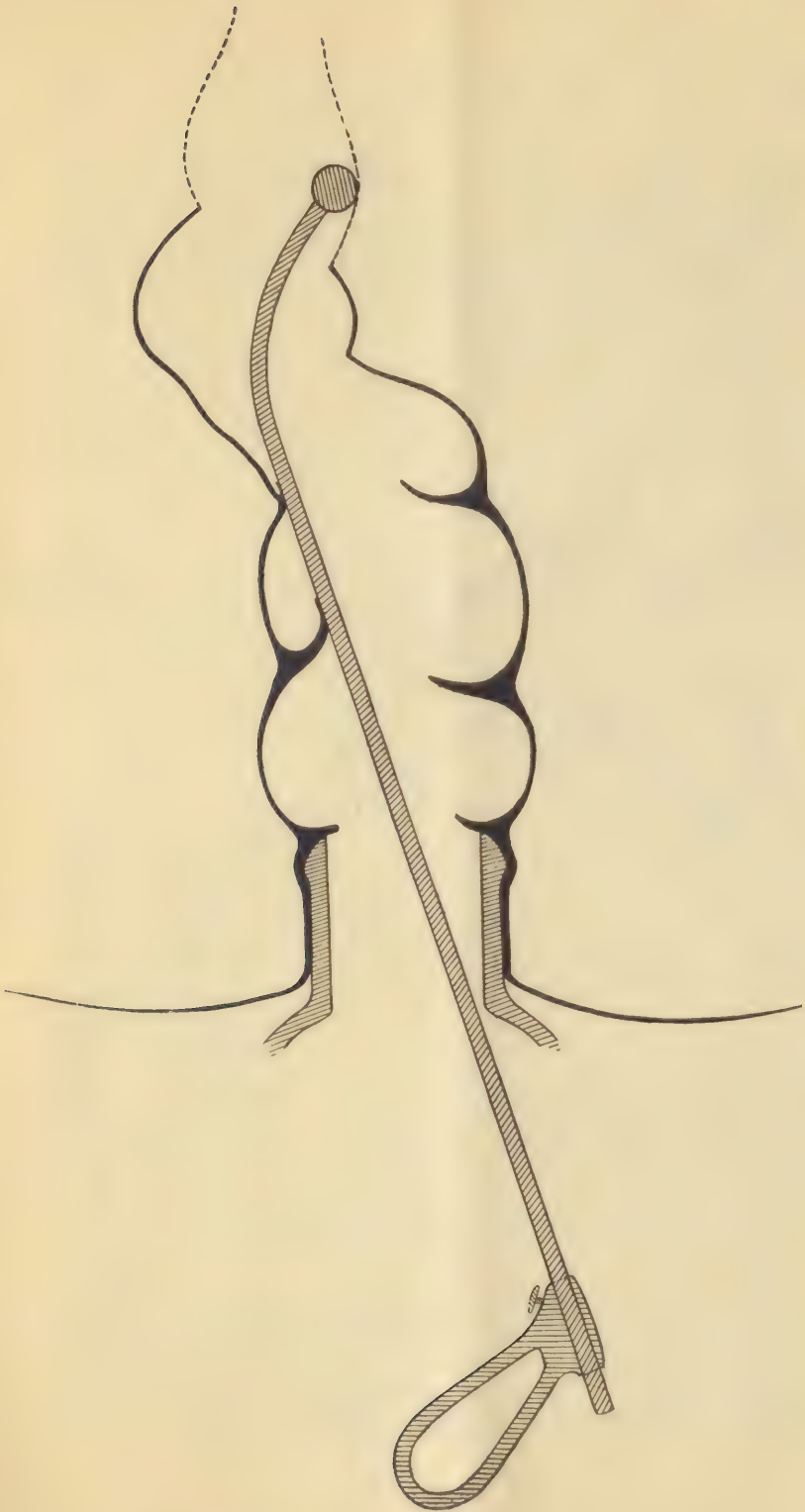


FIG. XI.—Diagrammatic Drawing of a Transverse Vertical Section showing the sound in the second position. (Half size.)

violence than is necessary for laryngoscopy, colonoscopy may be achieved.

The great advantage which this method of visual inspection affords the surgeon is the ability to declare to his patient with an unerring certainty that there is or is not disease of the ampulla or the lower half of the sigmoid flexure.

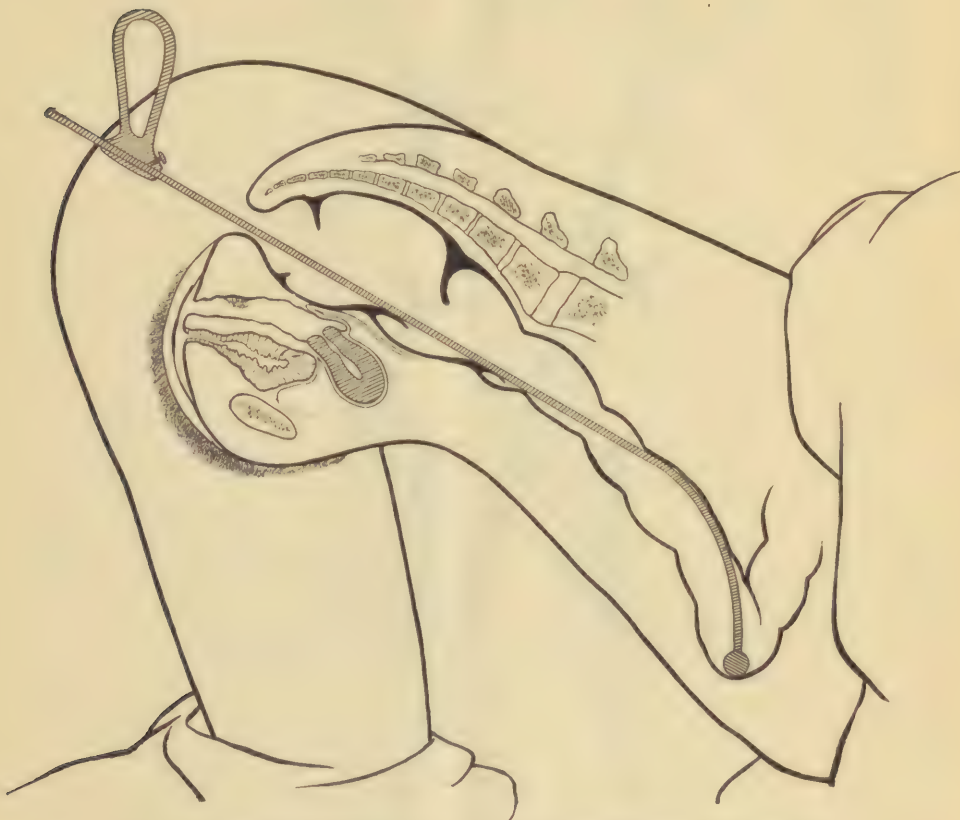


FIG. XII.—Diagrammatic Drawing of a Longitudinal Vertical Section showing the sound in the third position.

Observation by this method has taught me that in nearly all cases of disease at the anus there is congestion of the rectal mucous membrane at the ampulla, presenting the usual appearance of congestion; sometimes a diffused proctitis of a mild character attends hemorrhoids and fissure.

Those cases in which there is no apparent lesion at the anus, and which are in a general way diagnosed as catarrh of the rectum, will at once have their real cause, such as a high-up rectal polypus, congenital or organic stricture or ulceration, positively diagnosed, and will be made accessible for an intelligent treatment.

Inflammation of the sigmoid flexure of the colon will be readily recognized also. New growths or ulceration may be seen, and by means of a long-handled curette scrapings made in order that the microscopist may determine their exact character.

Stricture of the rectum and sigmoid need no longer be regarded as of only doubtful presence, and this method proves positively, even to the casual observer, how fallacious is the rectal sound as usually employed in the diagnosis of stricture. I have repeatedly proven how easy it is for an entering or returning bulb-sound to be caught and held by Houston's valves[§] and to elicit those signs which are generally considered diagnostic of organic stricture of the rectum and sigmoid flexure.

Prolapsus of the rectum and intussusception may be determined and in many cases, I believe, corrected almost instantly by this process, and the treatment of these conditions, because of the greatly increased accessibility afforded by this method, is made almost as easy as inspection.

Lesions of the sigmoid are accessible to surgical manipulation, and the gut for the depth of 35.56 cm. or 40.64 cm. (fourteen or sixteen inches) is readily seen and reached for the purpose of topical application.

Vesico-rectal and vagino-rectal fistulæ are apparent at a glance, and, I believe, may be operated upon through the atmospherically distended rectum with more than the usual success.

If this method of ocular examination be practiced, I am convinced there need be no longer any excuse for calling an undiagnosed disease of the rectum or sigmoid flexure obscure disease.

The Parsons Company, of Cleveland, make the instruments which are necessary to the practice of this method.

791 Prospect Street.

[§] A paper demonstrating the existence of Houston's valves and pleading the surgical importance of their universal recognition will be published subsequently.

